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Application No. 10/762,068

**REMARKS**

The Examiner's continued attention to the present application is noted with appreciation.

In the section 3 of the Office Action dated July 20, 2005, the Examiner rejected claim 6 under 35 U.S.C. § 112, second paragraph, as being indefinite stating, in section 4, that the term "weight classes 6-8" is an indefinite, relative term. The Examiner's continued consideration of this claim is appreciated. The Examiner noted in section 8 that further consideration of any evidence in support of claim 6 would be made.

Applicant has attached further evidence providing definitions of the relevant Department of Transportation Classes. The primary supporting document is a "Traffic Monitoring Guide" (Exhibit A) issued by the U.S. Department of Transportation Federal Highway Administration that is currently (and has been since at least 2001) available on that agency's web site (the relevant pages are Exhibit A, pp. 7-9). The other documents are generated by State (Ohio (Exhibit B) and Minnesota (Exhibit C)) agencies exemplifying the widespread use of that Federal vehicle classification system (previous documents submitted by Applicant exemplified the use of the classification system by industry entities).

However, Applicant notes that an error was made in stating that the classification system is based on weight (that error occurs in the application and in the last office action response). Therefore, Applicant respectfully submits amendments to the specification to delete the word "weight" which occurs in some, though not all, of the references to the classification within the specification. Also, claim 6 has been amended to more clearly recite the limitation.

In section 5 of the Office Action, the Examiner rejected claims 1-4, 6-11, and 15 under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. (U.S. Patent Appl. No. 2002/0005649) in view of Lucas, Jr. (U.S. Patent No. 5 816,650). That rejection is traversed. Hofmann et al. do not disclose a file cabinet seat support for a front seat. Claim 1 has been amended so that the clarification is made as to the structure of the seat support dictated by its intended use – the limitation that the drawer comprises a file compartment.

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Also, Applicant respectfully disagrees with the Examiner's conclusion that because Hofmann et al. disclose the cabinet used with any vehicle to increase cargo room, that it is obvious to use the present invention under a front seat. The comment of Hofmann et al. that "[a]lthough the seat assembly '10' has been specifically designed for a van-like or truck-like vehicle, the seat assembly '10' may be used with any vehicle to increase cargo room" is made in the context of the type of vehicle, not with the location of such a seat. (See Hofmann et al., paragraph 0032). Further, in the last two sentences of paragraph 0005, Hofmann et al. state: "Optimization of storage space in a way which does not involve substantial modifications to the vehicle would be especially beneficial. A drawer storage system which is located under the second row seat of a vehicle, which is accessible from either side, and which could be constructed without substantial design changes for the seat cushion or seat back would represent a substantial improvement in this art." (emphasis added). In paragraph 0007, Hofmann et al. state: "Another feature of the present invention is to provide an underseat storage system which may be accessed from either side of the vehicle by movement of one or more drawers in a direction transverse to the vehicle axis." In paragraph 0024, they state: "Third, a single drawer is shown in the Figures, but two separate drawers could be used, one accessed from each side of the vehicle. A single drawer may also be accessed from either side." Hofmann et al. are clearly teaching, and thereby limiting, their invention to something other than a front seat and to drawers that open toward either or both sides (i.e., toward the doors) of the vehicle. The present invention focuses on the front seat and on drawers that are easily accessible to the driver from the front seat without having to exit the vehicle. Claim 1 has been amended to clarify that distinction.

Further, Hoffman et al. disclose an underseat compartment that is necessarily integral or fixed to the seat as a unit. Its design is very related, and directed, to the design of the seat. The present invention is not so limited and can be removed easily and adapted to various seat designs.

Lucas, Jr. discloses a bin rather than a drawer, and the bin is movable in independent relation to the upstanding walls, but movable with the seat (See Lucas, Jr., Figs. 4 and 5, and claim 1). Thus, Lucas, Jr. teaches away from the present invention wherein the drawer is moveable independently of both the cabinet/frame and the seat. Also, given that the side walls "14" of Lucas, Jr. provide for the movement of both seat and bin in a forward and rearward direction (i.e., the bin cannot open from the side), Lucas Jr.

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teaches away from the present invention. (See Lucas, Jr. col. 1, lines 44-47: "Another object of the present invention is to provide a seat assembly of the type described above which provides a storage bin underneath the seat that does not interfere with the forward and rearward movement of the seat.").

Accordingly, Hofmann et al. and Lucas, Jr. each, and in combination, teach away from the present invention, and a combination of the two does not result in the present invention.

It is notable that the prior art references found do not disclose the use of file cabinets of any type being placed under a driver's seat. Arguably, such room is not always available under a front seat given that at least the driver must be positioned at an effective height above the cab floor to allow for safe and effective driving.

For the above reasons, claim 1 is believed to be patentable. For the same reasons, claim 3 is believed to be patentable. Claim 3 is also patentable as it is dependent on claim 1.

With regard to claim 6, it is notable that, as described in the penultimate paragraph of page 7 of the specification (referring to Figs. 1a and 1b), the typical support for the front seat of a large, commercial truck, such as a class 8 truck, provides such an effective storage height without having to impact the driver's seating height. Although Hofmann et al. do not limit their invention to a specific vehicle, the emphasis on drawers that open to the side and on a rear seat teach away from the present invention. Therefore, claim 6 is believed to be patentable, and is also patentable on the basis of its dependence on claim 1.

With regard to claim 15, Applicant is unable to locate any disclosure in Hofmann et al. showing that the partitions are movable and reconfigurable. The partitions ("50") of Hofmann et al. appear to be fixed and, moreover, are disclosed in the figures as not being useable for effective file storage. Claim 15 recites that the fasteners are for positioning the files when the drawer is closed. Hofmann et al. do not disclose this feature. Therefore, claim 15 is believed to be patentable, and claim 15 is also patentable based on its dependence on claim 1.

Claims 2, 4, and 7-11 are dependent on claim 1 and are therefore believed to be patentable as well.

In section 6 of the Office Action, the Examiner rejected claim 5 under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. in view of Lucas, Jr. and further in view of Pearse et al. (U.S. Patent No. 6,448,327). For the same reasons stated above, a combination of Hofmann et al. and Lucas Jr. do not

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contribute in making the present invention obvious, and adding Pearse et al., which shows what appears to be a small compartment on the surface of the open storage compartment, does not yield the small compartment on the outer door face. Claim 5 has been amended to indicate that the small compartment is on the outer door face. Therefore claim 5 is believed to be patentable.

In section 7 of the Office Action, the Examiner rejected claims 13, 14, and 16-20 under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. in view of Lucas, Jr. and further in view of Carico (U.S. Patent No. 5,895,086). For the same reasons given above, Applicant submits that Hofmann et al. and Lucas Jr. do not contribute to making the present invention obvious. Claim 13 recites the use of air pressure from an air brake system to signal the locking/unlocking of the locking component. Carico does not disclose such a feature. Moreover, the storage compartment of Carico is located outside the driver/passenger compartment. The limitation as to being able to open the storage compartment unless the vehicle is not moving is so apparent that there is no need to add any system to ensure that a driver will not exit the vehicle to open the storage compartment. In vehicles equipped with air brake systems and the vehicle is stopped (i.e., the brakes applied), air pressure changes which, if linked to the locking component, can signal that the vehicle is stopped, thereby making it safe to open the drawer. The prior art does not disclose the advantageous use of such braking systems to signal the safe use of the drawer. Claim 13 has been amended to clarify that the locking component is engageable when the vehicle is moving.

Claim 14 has been amended to indicate that the on/off signal comes from a vehicle component and that the signaling component and locking component are in linked communication. Similar amendments have been made to independent claims 16, 17, and 19. Therefore, claims 14, 16, 17, and 19 are believed to be patentable. Dependent claims 18 and 20 are therefore believed to be patentable.

In view of the above remarks, it is respectfully submitted that all grounds of rejection and objection have been traversed. It is believed that the case is now in condition for allowance and same is respectfully requested.

If any issues remain, or if the Examiner believes that prosecution of this application might be expedited by discussion of the issues, the Examiner is cordially invited to telephone the undersigned attorney for Applicant at the telephone number listed below.

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Respectfully submitted,

Date:

10/20/05

By:



Vidal A. Oaxaca, Reg. No.44,267  
Direct line: (505) 998-1505

PEACOCK MYERS, P.C.  
Attorneys for Applicant(s)  
P.O. Box 26927  
Albuquerque, New Mexico 87125-6927  
Telephone: (505) 998-1500  
Facsimile: (505) 243-2542

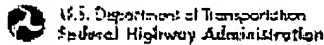
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Office of Highway Policy Information

# Traffic Monitoring Guide



Office of Highway Policy  
Information

This publication is provided in Acrobat PDF format (.PDF) as well as Microsoft Word (.DOC) format for downloading. It is organized by section and then by chapter.

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FHWA-PL-01-021

Section	PDF	Word
<a href="#">Executive Summary</a>	<a href="#">tmg0.pdf</a> (59 KB)	<a href="#">tmg0.doc</a> (83 KB)
<a href="#">Overview of the Traffic Monitoring Guide</a>	<a href="#">tmg1.pdf</a> (26 KB)	<a href="#">tmg1.doc</a> (48 KB)
<a href="#">Introduction to Traffic Monitoring</a>	<a href="#">tmg2.pdf</a> (305 KB)	<a href="#">tmg2.doc</a> (386 KB)
<a href="#">Traffic Volume Monitoring</a>	<a href="#">tmg3.pdf</a> (229 KB)	<a href="#">tmg3.doc</a> (233 KB)
<a href="#">Vehicle Classification Monitoring</a>	<a href="#">tmg4.pdf</a> (293 KB)	<a href="#">tmg4.doc</a> (408 KB)
<a href="#">Truck Weight Monitoring</a>	<a href="#">tmg5.pdf</a> (198 KB)	<a href="#">tmg5.doc</a> (422 KB)
<a href="#">Traffic Monitoring Data Formats</a>	<a href="#">tmg6.pdf</a> (56 KB)	<a href="#">tmg6.doc</a> (93 KB)

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United States Department of Transportation - Federal Highway Administration

EXHIBIT

A, p. 1

*Section 1**Traffic Monitoring Guide  
May 1, 2001*

# Section 1

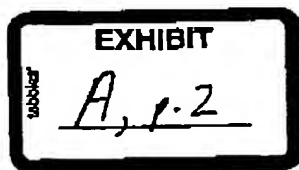
## Overview Of The Traffic Monitoring Guide

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Section 1

Traffic Monitoring Guide  
May 1, 2001**SECTION 1  
OVERVIEW OF THE TRAFFIC MONITORING GUIDE****CHAPTER 1  
OVERVIEW**

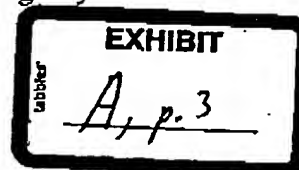
The TMG is intended to be a statement of good practice. It is not to be considered a federal standard. Data collection agencies are encouraged to consider the methods presented here in their administration of traffic data collection programs and to compare the effectiveness of this methodology to the procedures they currently use.

This document provides general guidance on the development of traffic monitoring programs for highway agencies. Its focus is on the collection of traffic volume, vehicle classification, and weight information. The TMG is designed as a reference document. Readers are encouraged to use the Table of Contents to identify sections of interest and to turn directly to those sections. The Executive Summary highlights the most important aspects and recommendations. The main body is organized into six major sections. The contents of sections 2 through 6 are summarized below:

**Section 2** introduces the basic parameters that affect the design and operation of traffic counting programs. This section includes a complete description of the variation found in traffic volumes and traffic characteristics, as well as the steps required to account for that variation when summary traffic statistics are developed. Section 2 presents a basic structure for collecting both short-term and continuous traffic data and describes how to use those data to improve the state's knowledge of traffic flow and performance. This material is expanded upon in sections 3, 4, and 5.

Section 2 also discusses the inter-relationships among different aspects of the traffic monitoring system. It discusses how a State can coordinate all aspects of a statewide traffic monitoring program, as well as how to make use of data collected for purposes outside of the traffic monitoring effort. These integration efforts allow a State highway agency to increase the amount of traffic monitoring data available while reducing the overall cost of collecting those data.

**Section 3** discusses traffic volume counting. This section focuses on the development of a complete traffic volume counting program, including provision of statistically valid traffic volume estimates and adjustment factors. These estimates are critical to both the reliability of information on traffic volumes and to the computation of many other variables, such as emission estimates, whose calculation are highly dependent on traffic volume estimates. Included in the section are discussions of the federal HPMS reporting requirements, other count programs required by highway agencies, the design of a continuous count program, and the development and application of the adjustment factors needed to meet the needs of each highway agency.





## Section 1

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Section 4 covers vehicle classification counts. This section updates previously published federal guidelines for collecting and reporting statewide samples of volumes by vehicle classification. It describes the FHWA vehicle classification categories, describes when other classification schemes should be used, discusses the need for continuous vehicle classification counters, and provides guidance in selecting the appropriate number and location of these counters. Section 4 also gives directions for creating factor groups (and a factor process) that can be used to improve the accuracy of estimates of annual average volume by classification based on short duration counts.

Section 5 presents truck weight data collection information. It discusses the use of weigh-in-motion equipment and describes the reasons for carefully calibrating and managing this type of equipment. This section also updates the recommended sample design process for providing statewide truck weight information and presents reporting ideas that may help States use their truck weight information more effectively.

Section 6 presents the coordinated record formats for station identification, traffic volume, vehicle classification, and truck weight data.

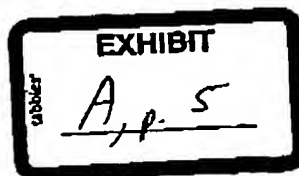


*Section 4*

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# Section 4

## Vehicle Classification Monitoring

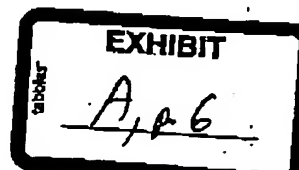


## Section 4

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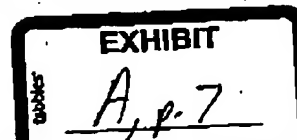
Traffic Monitoring Guide  
May 1, 2001APPENDIX 4-C  
FHWA VEHICLE TYPES

The classification scheme is separated into categories depending on whether the vehicle carries passengers or commodities. Non-passenger vehicles are further subdivided by number of axles and number of units, including both power and trailer units. Note that the addition of a light trailer to a vehicle does not change the classification of the vehicle.

Automatic vehicle classifiers need an algorithm to interpret axle spacing information to correctly classify vehicles into these categories. The algorithm most commonly used is based on the "Scheme F" developed by Maine DOT in the mid-1980s. The FHWA does not endorse "Scheme F" or any other classification algorithm. Axle spacing characteristics for specific vehicle types are known to change from State to State. As a result, no single algorithm is best for all cases. It is up to each agency to develop, test, and refine an algorithm that meets its own needs.

## FHWA VEHICLE CLASSES WITH DEFINITIONS

1. **Motorcycles (Optional)** -- All two or three-wheeled motorized vehicles. Typical vehicles in this category have saddle type seats and are steered by handlebars rather than steering wheels. This category includes motorcycles, motor scooters, mopeds, motor-powered bicycles, and three-wheel motorcycles. This vehicle type may be reported at the option of the State.
2. **Passenger Cars** -- All sedans, coupes, and station wagons manufactured primarily for the purpose of carrying passengers and including those passenger cars pulling recreational or other light trailers.
3. **Other Two-Axle, Four-Tire Single Unit Vehicles** -- All two-axle, four-tire, vehicles, other than passenger cars. Included in this classification are pickups, panels, vans, and other vehicles such as campers, motor homes, ambulances, hearses, carryalls, and minibuses. Other two-axle, four-tire single-unit vehicles pulling recreational or other light trailers are included in this classification. *Because automatic vehicle classifiers have difficulty distinguishing class 3 from class 2, these two classes may be combined into class 2.*
4. **Buses** -- All vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This category includes only traditional buses (including school buses) functioning as passenger-



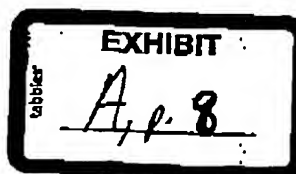
## Section 4

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carrying vehicles. Modified buses should be considered to be a truck and should be appropriately classified.

**NOTE:** In reporting information on trucks the following criteria should be used:

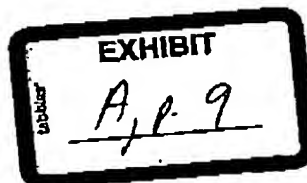
- a. Truck tractor units traveling without a trailer will be considered single-unit trucks.
  - b. A truck tractor unit pulling other such units in a "saddle mount" configuration will be considered one single-unit truck and will be defined only by the axles on the pulling unit.
  - c. Vehicles are defined by the number of axles in contact with the road. Therefore, "floating" axles are counted only when in the down position.
  - d. The term "trailer" includes both semi- and full trailers.
5. **Two-Axle, Six-Tire, Single-Unit Trucks** -- All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., with two axles and dual rear wheels.
  6. **Three-Axle Single-Unit Trucks** -- All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., with three axles.
  7. **Four or More Axle Single-Unit Trucks** -- All trucks on a single frame with four or more axles.
  8. **Four or Fewer Axle Single-Trailer Trucks** -- All vehicles with four or fewer axles consisting of two units, one of which is a tractor or straight truck power unit.
  9. **Five-Axle Single-Trailer Trucks** -- All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.
  10. **Six or More Axle Single-Trailer Trucks** -- All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.
  11. **Five or fewer Axle Multi-Trailer Trucks** -- All vehicles with five or fewer axles consisting of three or more units, one of which is a tractor or straight truck power unit.
  12. **Six-Axle Multi-Trailer Trucks** -- All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.



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13. **Seven or More Axle Multi-Trailer Trucks** -- All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit.



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fhwa vehicle classification

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Results 1 - 10 of about 66,000 for fhwa vehicle classification - 0.11 sec. (About this page)

1. **FHWA Vehicle Classification**

... FHWA Vehicle Types. The classification scheme is separated into categories depending on whether the vehicle carries ... to a vehicle does not change the classification of the vehicle. ...

www.fhwa.dot.gov/policy/ohpi/vehclass.htm - 7k - [Cached](#) - [More from this site](#) - [Save](#) - [Block](#)

2. **Section 4 - Vehicle Classification Monitoring**

Traffic Monitoring Guide - May 1, 2001. Section 4. Vehicle Classification Monitoring. Table of Contents. FIGURES. TABLES. Section 4. Vehicle Classification Monitoring. Chapter 1. Introduction ... 1980's, the FHWA developed the 13-category scheme used for most federal vehicle classification count reporting (Appendix ...

www.fhwa.dot.gov/ohim/tmguid/tmg4.htm - [More from this site](#) - [Save](#) - [Block](#)

3. **VEHICLE CLASSIFICATION (PDF)**

... vehicles are classified in accordance with the current FHWA Vehicle Classification ... includes 13 vehicle classes as follows: FHWA Vehicle Classification. 1. Motorcycles (Optional ...

deldot.gov/static/pubs/fhwa\_vehicle\_classification.pdf - 8k - [View as html](#) - [More from this site](#) - [Save](#) - [Block](#)

4. **FHWA Vehicle Classification Scheme F Report (PDF)**

... FHWA Vehicle Classification Scheme F Report ... Included in this classification are pickups, panels, vans, and other vehicles such as ...  
dot.state.oh.us/techservsite/availpro/.../FHWA\_Scheme\_F\_Report.PDF - 153k - [View as html](#) - [More from this site](#) - [Save](#) - [Block](#)

5. **Meeting Minutes (PDF)**

... overview. VEHICLE CLASSIFICATION STANDARDS. - Review Standards. - The FHWA Traffic Monitoring ... classification was discussed using the Illinois Vehicle Classification Summary as an ...

dot.state.mn.us/guidestar/pdf/pnids/Project Meeting Minutes Dec 16... - 155k - [View as html](#) - [More from this site](#) - [Save](#) - [Block](#)

6. **Publications-Vehicle Classification**

... Analysis of Vehicle Classification and Truck Weight Data of the New England States [ ... Field Evaluation of FHWA Vehicle Classification Categories - MDOT. Highway Performance Monitoring ...

www.nmsu.edu/~traffic/Publications/Vc/Pub\_Vehicleclass.htm - [More from this site](#) - [Save](#) - [Block](#)

7. **PORTABLE NON-INTRUSIVE TRAFFIC DETECTION SYSTEM (PDF)**

... classification scheme was developed by the FHWA for federal vehicle. classification count reporting in the ... It to provide vehicle classification patterns for the FHWA and their own ...

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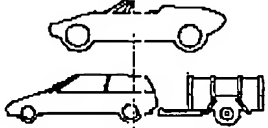
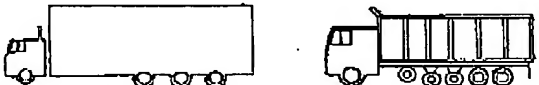
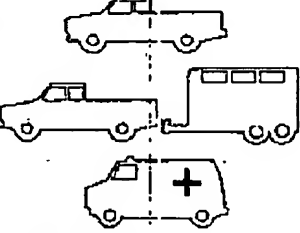
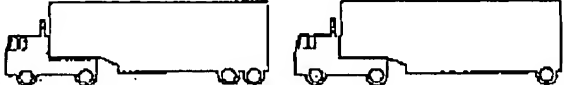
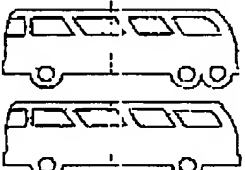
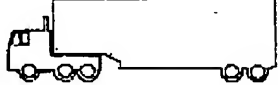
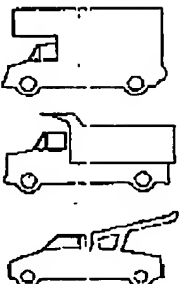

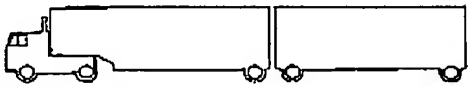
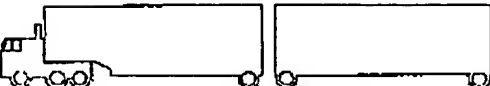

8. **http://www.aot.state.vt.us/techservices/Documents/TrafResearch/Publications/eslfac97.txt**

... Current year vehicle percent by FHWA class as found in the Automatic Vehicle Classification report. Each ... trailer truck LIGHT Passenger vehicle (FHWA Vehicle Class 1-3) MEDIUM Single ...

EXHIBIT

B. p. 1

# FHWA Vehicle Classification Scheme F Report

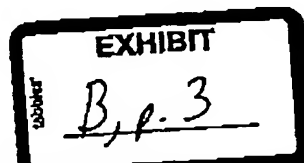
<b>1</b>  MOTORCYCLES	<b>6</b>  THREE AXLE, SINGLE UNIT
<b>2</b>  PASSENGER CARS	<b>7</b>  FOUR OR MORE AXLE, SINGLE UNIT
<b>3</b>  FOUR TIRE, SINGLE UNIT	<b>8</b>  FOUR OR LESS AXLE, SINGLE TRAILER
<b>4</b>  BUSES	<b>9</b>  FIVE-AXLE, SINGLE TRAILER
<b>5</b>  TWO AXLE, SIX TIRE SINGLE UNIT	<b>10</b>  SIX OR MORE AXLE, SINGLE TRAILER
	<b>11</b>  FIVE OR LESS AXLE, MULTI-TRAILER
	<b>12</b>  SIX AXLE, MULTI-TRAILER
	<b>13</b>  SEVEN OR MORE AXLE, MULTI-TRAILER

EXHIBIT

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- Class 1- **Motorcycles:** All two- or three-wheeled motorized vehicles. Typical vehicles in this category have saddle type seats and are steered by handle bars rather than wheels. This category includes motorcycles, motor scooters, mopeds, motor-powered bicycles, and three-wheeled motorcycles.
- Class 2- **Passenger Cars:** All sedans, coupes, and station wagons manufactured primarily for the purpose of carrying passengers and including those passenger cars pulling recreational or other light trailers.
- Class 3- **Other Two-Axle, Four-Tire, Single Unit Vehicles:** All two-axle, four-tire, vehicles other than passenger cars. Included in this classification are pickups, panels, vans, and other vehicles such as campers, motor homes, ambulances, hearses, carryalls, and minibuses. Other two-axle, four-tire single unit vehicles pulling recreational or other light trailers are included in this classification.
- Class 4- **Buses:** All vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This category includes only traditional buses (including school buses) functioning as passenger-carrying vehicles. Modified buses should be considered to be trucks and be appropriately classified.
- Note:** In reporting information on trucks the following criteria should be used:
- a. Truck tractor units traveling without a trailer will be considered single unit trucks.
  - b. A truck tractor unit pulling other such units in a "saddle mount" configuration will be considered as one single unit truck and will be defined only by axles on the pulling unit.
  - c. Vehicles shall be defined by the number of axles in contact with the roadway. Therefore, "floating" axles are counted only when in the down position.
  - d. The term "trailer" includes both semi- and full trailers.
- Class 5- **Two-Axle, Six-Tire, Single Unit Trucks:** All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., having two axles and dual rear wheels.
- Class 6- **Three-axle Single unit Trucks:** All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., having three axles.
- Class 7- **Four or More Axle Single Unit Trucks:** All trucks on a single frame with four or more axles.
- Class 8- **Four or Less Axle Single Trailer Trucks:** All vehicles with four or less axles consisting of two units, one of which is a tractor or straight truck power unit.
- Class 9- **Five-Axle Single Trailer Trucks:** All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.
- Class 10- **Six or More Axle Single Trailer Trucks:** All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.
- Class 11- **Five or Less Axle Multi-Trailer Trucks:** All vehicles with five or less axles consisting of three or more units, one of which is a tractor or straight truck power unit.
- Class 12- **Six-Axle Multi-Trailer Trucks:** All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.
- Class 13- **Seven or More Axle Multi-Trailer Trucks:** All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit.
- Class 14- **Will be defined by ODOT personnel for special studies.**
- Class 15- **Will by default identify any vehicle which does not conform to the classification criteria for Class 1 through Class 14.**



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**1. FHWA Vehicle Classification**

... FHWA Vehicle Types. The classification scheme is separated into categories depending on whether the vehicle carries ... to a vehicle does not change the classification of the vehicle. ...

www.fhwa.dot.gov/policy/ohpi/vehclass.htm - 7k - [Cached](#) - [More from this site](#) - [Save](#) - [Block](#)

**2. Section 4 - Vehicle Classification Monitoring**

Traffic Monitoring Guide - May 1, 2001. Section 4. Vehicle Classification Monitoring. Table of Contents. FIGURES. TABLES. Section 4. Vehicle Classification Monitoring. Chapter 1. Introduction ... 1980's, the FHWA developed the 13-category scheme used for most federal vehicle classification count reporting (Appendix ...

www.fhwa.dot.gov/ohim/tmguid/tmg4.htm - [More from this site](#) - [Save](#) - [Block](#)

**3. VEHICLE CLASSIFICATION (PDF)**

... vehicles are classified in accordance with the current FHWA Vehicle Classification ... includes 13 vehicle classes as follows: FHWA Vehicle Classification. 1. Motorcycles (Optional ...

deldot.gov/static/pubs\_forms/new/25-vehicle\_classification.pdf - 8k - [View as html](#) - [More from this site](#) - [Save](#) - [Block](#)

**4. Field Evaluation of FHWA Vehicle Classification Categories - MDOT, 1985**

Field Evaluation of FHWA Vehicle Classification Categories - MDOT, 1985. John H. Wyman, Gary A. Braley, Robert I. Stevens. Maine Facility Laboratory. Materials and Research Division. Maine Department of Transportation ... Lyles, Wyman; July 31, 1982; Evaluation of Vehicle Classification Equipment) a scheme "E" was selected from ...

www.nmsu.edu/~traffic/Publications/VC/Abstracts/fhwa.htm - 11k - [Cached](#) - [More from this site](#) - [Save](#) - [Block](#)

**5. FHWA Vehicle Classification Scheme F Report (PDF)**

... FHWA Vehicle Classification Scheme F Report ... Included in this classification are pickups, panels, vans, and other vehicles such as ... dot.state.oh.us/techservsite/availpro/.../FHWA\_Scheme\_F\_Report.PDF - 153k - [View as html](#) - [More from this site](#) - [Save](#) - [Block](#)

**6. Meeting Minutes (PDF)**

... overview. VEHICLE CLASSIFICATION STANDARDS. • Review Standards. - The FHWA Traffic Monitoring ... classification was discussed using the Illinois Vehicle Classification Summary as an ...

dot.state.mn.us/guidestar/pdf/pnits/Project Meeting Minutes Dec 16... - [More from this site](#) - [Save](#) - [Block](#)

**7. Publications-Vehicle Classification**

... Analysis of Vehicle Classification and Truck Weight Data of the New England States [ ... Field Evaluation of FHWA Vehicle Classification Categories - MDOT. Highway Performance Monitoring ...

www.nmsu.edu/~traffic/Publications/VC/Pub\_Vehicleclass.htm - [More from this site](#) - [Save](#) - [Block](#)

**8. PORTABLE NON-INTRUSIVE TRAFFIC DETECTION SYSTEM (PDF)**

EXHIBIT

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## Meeting Minutes

### Portable Non-Intrusive Traffic Detection System (PNITDS)

#### Project Meeting

Date: Tuesday, December 16, 2003

Time: 1:00 p.m. to 3:00 p.m.

Place: SRF Consulting Group

#### ATTENDEES:

Jerry Kotzenmacher	Mn/DOT
Tom Nelson	Mn/DOT
Erik Minge	SRF
Ben Hao	SRF

#### INTRODUCTION

Jerry Kotzenmacher gave a brief PNITDS overview.

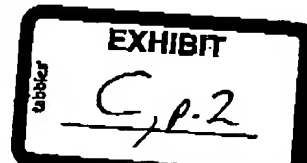
#### VEHICLE CLASSIFICATION STANDARDS

##### • Review Standards

- The FHWA Traffic Monitoring Guide defines thirteen axle-based vehicle classes and four length-based vehicle classes. The four vehicle length classes are: Passenger Vehicles, Single Unit Trucks, Combination Trucks and Multi-trailer Trucks. See Appendix A for the details of both standards.
- Three to five vehicle length classifications are defined by other state DOTs. They are mapped to FHWA's definitions. The typical four vehicle classes defined in the states are: Passenger Cars, Single Unit Trucks, Single Trailer Trucks and Multi-Trailer Trucks.
- The connection and relationship between axle classification and length classification was discussed using the Illinois Vehicle Classification Summary as an example.
- Tom noted that the total length of a single trailer truck is about 80 feet to 83 feet, which exceeds the upper length bound for combination truck defined in FHWA standards.
- See previous meeting minutes for additional classification discussion.

##### • Mn/DOT Vehicle Class Standard and Data Collection Requirements

- Tom presented the Mn/DOT-defined eight axle-based vehicle class scheme. See Appendix B for the details.
- Tom noted that Mn/DOT vehicle class data is collected primarily for pavement design. Truck types, weights, axle loads and damage factors derived from the vehicle class data are used in roadway pavement designs for various reconstruction projects. Class data is also provided for FHWA 13-class reports and the FHWA Highway Performance Monitor Service (HPMS).



**Appendix A: FHWA Vehicle Classes with Definitions**  
(Traffic Monitoring Guide - May 1, 2001)

1. **Motorcycles (Optional)** – All two or three-wheeled motorized vehicles. Typical vehicles in this category have saddle type seats and are steered by handlebars rather than steering wheels. This category includes motorcycles, motor scooters, mopeds, motor-powered bicycles, and three-wheel motorcycles. This vehicle type may be reported at the option of the State.
2. **Passenger Cars** – All sedans, coupes, and station wagons manufactured primarily for the purpose of carrying passengers and including those passenger cars pulling recreational or other light trailers.
3. **Other Two-Axle, Four-Tire Single Unit Vehicles** – All two-axle, four-tire, vehicles, other than passenger cars. Included in this classification are pickups, panels, vans, and other vehicles such as campers, motor homes, ambulances, hearses, carryalls, and minibuses. Other two-axle, four-tire single-unit vehicles pulling recreational or other light trailers are included in this classification. *Because automatic vehicle classifiers have difficulty distinguishing class 3 from class 2, these two classes may be combined into class 2.*
4. **Buses** – All vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This category includes only traditional buses (including school buses) functioning as passenger-carrying vehicles. Modified buses should be considered to be a truck and should be appropriately classified.

**NOTE:** In reporting information on trucks the following criteria should be used:

- a. Truck tractor units traveling without a trailer will be considered single-unit trucks.
  - b. A truck tractor unit pulling other such units in a "saddle mount" configuration will be considered one single-unit truck and will be defined only by the axles on the pulling unit.
  - c. Vehicles are defined by the number of axles in contact with the road. Therefore, "floating" axles are counted only when in the down position.
  - d. The term "trailer" includes both semi- and full trailers.
5. **Two-Axle, Six-Tire, Single-Unit Trucks** – All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., with two axles and dual rear wheels.
  6. **Three-Axle Single-Unit Trucks** – All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., with three axles.
  7. **Four or More Axle Single-Unit Trucks** – All trucks on a single frame with four or more axles.
  8. **Four or Fewer Axle Single-Trailer Trucks** – All vehicles with four or fewer axles consisting of two units, one of which is a tractor or straight truck power unit.
  9. **Five-Axle Single-Trailer Trucks** – All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.
  10. **Six or More Axle Single-Trailer Trucks** – All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.
  11. **Five or fewer Axle Multi-Trailer Trucks** – All vehicles with five or fewer axles consisting of three or more units, one of which is a tractor or straight truck power unit.
  12. **Six-Axle Multi-Trailer Trucks** – All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.
  13. **Seven or More Axle Multi-Trailer Trucks** – All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit.

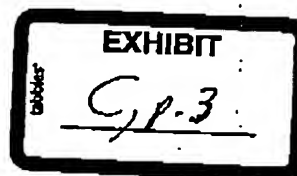


Table 4-2-1

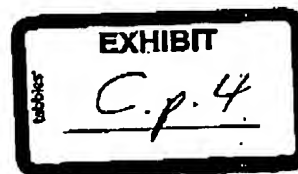
## Axle Based Classifications

Vehicle Class	Average Number of Axles Per Vehicle
1	2
2	2
3	2
4	2.2
5	2
6	3
7	4
8	4
9	5
10	6
11	5
12	6
13	7

Table 4-A-1

## Length Based Classification Boundaries

Primary Description of Vehicles Included in the Class	Lower Length Bound	Upper Length Bound
	>	< or =
Passenger vehicles (PV)	0 m (0 ft)	3.96 m (13 ft)
Single unit trucks (SU)	3.96 m (13 ft)	10.67 m (35 ft)
Combination trucks (CU)	10.67 m (35 ft)	18.59 m (61 ft)
Multi-trailer trucks (MU)	18.59 m (61 ft)	36.58 m (120 ft)



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